WHITE PAPER

**CLINICAL INFORMATION AND
COMMUNICATION PROCESSES**

OCCUPATIONAL HEALTH SERVICES PILOT PROJECT

Draft: November 27, 2000

Introduction

This paper will focus on those aspects of communication and information management associated with the clinical aspects of the claim, including medical claims management, care coordination, and quality assurance. This discussion of issues and solutions is a continuation of the ideas presented in the white paper on administrative information processes. The basic ideas from the previous white papers are the basis for much of the discussion, and key pieces of information may be touched upon again in this document. However, for the sake of brevity, duplicate concepts or issues will be cross-referenced as much as possible.

Identification of the Issues

Once the workers' compensation claim has been initiated, information starts to flow from many different sources. The employer, worker, medical providers, and claims managers all have different pieces of the picture that comprise the overall claim. A significant deficiency in workers' compensation is that the pieces are rarely pulled into a focused picture that is of value to anyone.[1] A reliable information management system will be the key for the COHE and the claims management staff to be more effective in their respective roles.

Some of the basic issues regarding administrative communication that must still be considered include:

- No additional administrative burdens should be placed on treating providers that would push providers away from the treatment of work injury cases and create access to care issues.

- Impediments to communication represent possible increased costs through delays in return to work, postponed treatment, and prolonged recovery.

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[1] Occupational Health Services: A Guide to Program Planning and Management. Published 1989 by The American Hospital Association (Newkirk and Jones Eds.) pp 57-70; Injured Worker Tracking.

- The medical provider and employer need to become part of the overall communication loop, both providing and receiving current information.

- LINIIS will continue to be the basic information foundation used by Labor and Industries' claims management staff.

- Electronic exchange of information will be an important component to any final solution.

Some issues, specific to improvement of the clinical communication and information management, were raised in the interviews with Labor and Industries' Claims Managers and Occupational Nurse Consultants.[2] Others are directly related to the functions outlined in the white papers on care coordination and quality assurance.

- Objective medical findings and ongoing treatment plans are not always communicated in a clear and timely manner.

- Changes in worker status, including diagnosis, prognosis, and work capacity, are not being communicated in a timely manner.

- While treatment guidelines are universally available on the Labor and Industries web page and in written format for providers who request them,   there is currently no easy method for monitoring compliance with the guides.

- The medical history provided with claims is not in a chronological format that is easy for the Claims Managers or ONCs to use.

- There is currently no system in place to support computerized patient tracking and, therefore, the care coordination function.

- Information exchange between the COHE and Labor and Industries will require a two-way path so that medical and claim information can be synchronized, avoiding the possible problem of providers being required to send the same information to two different groups.

- There is currently no system in place to measure and monitor the quality indicators that were identified as being of value in the white paper on quality assurance, or to monitor compliance with treatment guidelines.

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[2] Information received from interviews and responses to questions posed to Labor and Industries' Claims Managers and Occupational Health Nurse Case Managers.

- Patient education and injury prevention activities are not currently documented.

- There is a perception that it is more difficult to obtain medical record information from medical providers located in rural locations.[3]

- Employers believe that they should have better access to their claim information, including medical information, patterns of recurring injuries, claim status, and current work accommodations.[4]

- Medical confidentiality is a universal concern in discussions regarding electronic exchange of information or providing direct access to Labor and Industries' data records to employers and providers.

- Hand written notes from medical providers can be difficult to understand.

- There is insufficient information available in current systems regarding job function and the employers' willingness or ability to accommodate work restrictions.

What is the current state?

The overall state of affairs for the communication of clinical information is not very different than it is for administrative information. The majority of communication from providers is accomplished through postal services, with some telephonic case management on the part of Labor and Industries' staff. The majority of communication from Labor and Industries to employers and providers is accomplished via telephone or in writing. However, currently initiatives are being tested that would allow employers, attorneys and providers some access to information in LINIIS.

Most of the clinical information is received as part of the medical billing and bill review process. This means that, depending upon the billing cycle of providers, claims managers may be working with information that is as much as 2-4 weeks old. As medical bills are received with treatment records attached, the records are separated and sent to be imaged and made available for claims administration on LINIIS. The imaging process represents some additional delay in the availability of the records.

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[3] Comments made by Labor and Industries' Claims Managers.

[4] Washington Labor and Industries survey of employers conducted by Gilmore Research Group in September 2000, indicating that nearly three quarters of employers do not routinely receive the information needed to manage their own workers' compensation issues.

Some other key items that were brought out by claims staff included duplicate records being entered into LINIIS because there is no system in place to segregate duplicate items so they do not appear in the record. There is also no ability to summarize the medical information in the chronological order that treatment occurs.[5]

Technological Considerations

Addressing the key issues and meeting the care coordination functions described in an earlier white paper will require the support of state-of-the-art information management tools. Access to state-of-the-art occupational health software was clearly identified as one of the benchmarks that differentiated best practices in occupational health.[6] To perform its designated role effectively, the COHE is going to need access to such tools.

Caution must be taken when examining information management based solutions because they can often be expensive and fall short of expectations. There are three separate components that must be considered: software, logistics, and infrastructure.

A. Software Considerations

Based upon the COHE functions outlined in previous white papers, the data management software will need to perform some very specific functions. An outline of those functions can be found in Appendix A. However, there are considerations beyond specific data management functions that come into play:

- Any software used by the COHE will need to interface in live time with LINIIS. Without a live interface between the systems, one of two alternatives will have to occur. One would be that medical providers would have to submit their information twice, increasing their administrative burden. It has already been noted that this could lead to problems associated with access to care. The second alternative would be the use of manual communication between the COHE and Labor and Industries, effectively diminishing much of the anticipated benefits associated with the care coordination function.

- Interface solutions can be expensive to develop, and have the potential to increase the costs of implementing the Occupational Health Services Project.

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[5] Information on medical claim information in LINIIS provided by Labor and Industries' Claims Personnel.

[6] Research from Occupational Health Services Pilot Project white paper: Enhancing Providers' Occupational Health Expertise.

- Several occupational health software packages are commercially available. However, after comparing the software features in Appendix A with the features of currently available products, it appears that no single product fully meets the optimal specifications.[7] That creates four alternatives for consideration:
  - Compromise on function and allow the COHE to utilize existing products.
  - Commission one or more of the existing vendors with the task of modifying their product to meet the desired minimum functions.
  - Invest in the process of development of a new software product that will exactly match the desired specifications.
  - Invest in modifications to LINIIS to make it compatible with the preferred model.

B. Logistical considerations

The primary logistical issue is where the COHE software will reside. There are two fundamental choices:

- Place the software and associated databases within the COHE itself. This decision raises yet another issue regarding whether a common software product will be mandated or if each COHE will be free to use a package of their choosing. A mandated program may limit some healthcare systems in the process of bidding as a COHE. However, allowing flexibility in the selection of software may also create limits if the COHE must incur costs associated with programming changes to make their products meet the minimum requirements. Also, multiple systems will require multiple interfaces, and will increase the costs of the overall system.

- Place the software and associated databases within Labor and Industries, allowing for access by the COHE for the completion of their work. There may be some interface advantages associated with this option but the clear advantage is that the debate regarding a single system or multiple systems disappears. Depending on the software solution that is selected, there may still be some development costs, but these costs would only be incurred a single time by the overall system. Since the COHE would likely have to make some software investment to perform its duties, it probably would not be unreasonable to expect that Labor and Industries could charge an access fee as a way to recover any development costs.

C. Communication Infrastructure

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[7] Review of promotional literature for the five leading occupational health software vendors. Reference information for each vendor is provided in Appendix C.

Regardless of the software that is used or the location of that software, some electronic connection between the COHE and Labor and Industries must exist if the desired state described in previous white papers is to be realized. The technology that is driving connectivity between geographically separate databases is constantly changing. In fact, it is recent changes in technology that makes it feasible to consider a single, centralized database as a realistic logistical option. There are, essentially, three options to consider in evaluation of infrastructure.

- Traditional dialup connections between computers.

- Direct point-to-point connections between individual computers or between local networks using leased phone lines such as T-1 lines.

- Internet-based connection allowing remote access to databases and software applications located at some central location. This is the most technologically current approach and most likely represents the direction of information management in general.[8] This technology makes it financially and operationally feasible to consider using a common, centralized software system rather than multiple remote applications at each COHE. This option is outlined in more detail in Appendix B.

What is the desired future state?

Successful coordination of care, quality assurance, and claims management will be dependent upon information management. To insure the highest level of effectiveness for these processes, an information management system and supporting procedures that will facilitate the flow of information among medical providers, employers, claims managers, workers, worker representatives, and care coordinators should be put in place. These systems will be designed to minimize the administrative burden of sharing information among interested parties, take advantage of the latest technological developments, and minimize the costs of development, implementation, and operation.

What are the best ways to achieve the desired future state?

Fundamental change in the desired direction will require focus on three general areas:
1.   Quality and consistency of clinical information from providers.
2.   The timing of information that is exchanged between all parties.
3.   The methods used for all parties to communicate with each other.

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[8]   Internet-based connectivity description at www.citrix.com

A. Establish a centralized database for care coordination activities
Given the issues associated with implementation of a software package that will meet the needs of the COHE, the costs associated with interfaces and connectivity, and current technological capability, the most efficient approach to information management will be a centralized database of information located within Labor and Industries.

The functional specifications of the software are outlined in Appendix A. These specifications represent an optimal software package and it is suggested that these specifications be used in any RFP that is sent to solicit bids from software vendors. As indicated, it is not expected that any one vendor will be able to meet all of the requested specifications. Therefore, the RFP should also provide an allowance for each vendor to address their deficiencies and propose solutions for those deficiencies. The vendors should be instructed to provide a base price for their existing products as well as a supplemental cost associated with their proposed solution for any specifications that they are not able to meet with their existing product.

Once the bids are received from each vendor, Labor and Industries can then evaluate the existing products against the ideal desired state. If it is determined that the supplemental costs associated with meeting all of the desired specifications, the informed decisions can be made regarding which specifications to compromise weighed against the cost associated with developing working solutions.

The software program will run parallel to LINIIS, with the two systems continually updating each other as information is received from various sources. The COHE staff, providers, and employers can be provided access using an Internet-based connection similar to the one outlined in Appendix B.

B. Establish the COHE as a central communication point
Effective care coordination, by nature, requires that the care coordinator be in the middle of the information loop with access to the most current information relative to each case.[9] [10] Supporting the care coordinator in this role is the COHE software application. To be successful in their care coordination role, it is critical that they have access to information from all of the other sources. Effective communication has two distinct components: input and output. Information will be made available to the care coordinator through various sources:

- The Report of Accident (ROA) information will be immediately made available on the COHE software as it is either electronically entered into LINIIS or received by Labor and Industries in some other

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[9] Occupational Health Services: A Guide to Program Planning and Management. Published 1989 by The American Hospital Association (Newkirk and Jones Eds.) pp 57-70; Injured Worker Tracking.

[10] Occupational Health Services: Practical Strategies for Improving Quality and Controlling Costs. Published 1993 by The American Hospital Association (Newkirk) pp 57-78; Building Injury Management Systems that Contain Workers' Compensation Costs.

format. In some cases the ROA may be filed directly with the COHE where it is immediately entered in the system and channeled back to LINIIS.

- Medical treatment and work status updates are received directly by the COHE within 24-48 hours of each visit. This communication between the care coordinators and the medical providers will be accomplished in a manner that is agreed upon between the providers and the COHE, but could be through telephonic update, faxed records, or completion of electronic forms. The care coordinator will be responsible for insuring that the information is updated within the COHE software.

- The care coordinator telephonically receives work site information, including job duties and transitional duty accommodations, from the employer.

- Claims status and medical management information is made available as it is updated within LINIIS.

As the care coordinator receives the information, he or she becomes responsible for dissemination of the information to the various parties that need it. This is accomplished through a combination of telephonic reporting, electronic downloads, and automated computer-generated reports. Specific polices for this function will need to be established, but the following guidelines will apply.

- LINIIS will always be updated as the information is entered into the COHE software. Since the care coordinator is obtaining basic medical and work status information within 24-48 hours of treatment, this interface represents a significant improvement in the current state. Labor and Industries' claims staff will, therefore, have access to updated medical information without any significant change in their current work process.

- The care coordinator will establish telephonic contact with the employer within 24 hours of the filing of a new claim to insure that the employer is aware of the injury and to assist as appropriate in the coordination of the claimant's return to work.

- The care coordinator will also contact the employer telephonically within 24 hours of any significant change in the status of any case, including changes in diagnosis, prognosis, or work status.

- All patients who are either off work or on a light duty status will be called within 24 hours of initial treatment. There are several purposes for this call. First, it is an opportunity for the care coordinator to check on how the patient is doing and how satisfied

the patient is with initial care. The second is to provide an introduction to the patient and some basic orientation to navigating the workers' compensation system and the healthcare system. Finally, the call will establish the care coordinator as a resource from whom the patient receives assistance.

- Employers will be provided with written summaries on a periodic basis that will keep them current on their ongoing cases. Less frequent summaries will provide injury trending data for each employer.

- The care coordinator will contact providers telephonically with any information from the employer or Labor and Industries that may have an impact upon the provider's medical management decisions.

C. Establish some standardized reporting formats

Several states, such as California,[11] have established standard forms for the purpose of supplemental medical reporting and work status. Regulations covering the use of these forms vary from state to state, but in most cases, the provider is required to file the form within a defined period and is paid some fee for completion of the information on schedule. Given that one of the recurring concerns of Labor and Industries' claims staff is the lack of consistency in the medical information that is provided, some standardization of supplemental reports could be beneficial.

Care must be taken, however, to not create additional administrative burden on the providers. An argument can easily be made that the providers would already be supplying the information to the care coordinator.

One option would be to integrate the supplemental reporting with the information that is being provided to the COHE so that compliance with the care coordination process would constitute compliance with the reporting requirement. In this format, a standard treatment summary form would be developed, and providers would be asked to complete it with each patient visit. The form could be provided to them in an electronic format so they could have the option of electronically completing the information locally and then transmitting it to the COHE through the Internet or dialup connection. This would serve a dual purpose of increasing the efficiency of the care coordinator if the electronic submission were to also automatically populate the associated data fields in the COHE software. To this end, the development of the form should be made after the software specifications are defined. Providers who choose not to submit the information electronically could either complete and fax a form, or provide the information when the care coordinator contacts them telephonically.

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[11] California State regulations referenced from www.dir.ca.gov/dwc

Regardless of the method of information transmission, the use of a standard form as part of the patient evaluation process will insure that fundamental pieces of treatment and return to work information are gathered and communicated throughout the duration of the medical treatment process.

D. Compliance with Treatment Quality Indicators

As treatment is provided in each case, some process will be needed to evaluate the course of medical care being delivered against the preferred treatment quality indicators. In the absence of such a monitor, treatment guidelines of any kind will have a limited impact. When the actual care drifts away from the accepted guides, there are opportunities for educational intervention by the respected onsite colleague.[12] For these opportunities to be realized, there must be systems in place to easily identify when they occur.

The first step in this process will be the posting of the desired treatment guides on the COHE care coordination database. The second step will be the development of protocols for the entry of medical information into the COHE database that will make it possible for the software program to cross-reference the care provided against the desired treatment guideline. The care coordinator will be automatically warned when the path of medical care moves outside of the desired protocol. The respected onsite colleague, claim managers, or occupational nurse consultants can then evaluate those cases to determine the need for intervention.

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[12] The respected onsite colleague is identified as one of the most effective educational methods in the white paper on Enhancing Attending Physician Occupational Health Expertise.

APPENDIX A

COHE Care Coordination Software Functional Description

As indicated in both white papers on communication and information management, successful care coordination is highly dependent upon the support of an occupational health information management package. The software tools will be the foundation of an effective case tracking system and as such will consist of two major segments. The first of these is data collection, storage, and management, and the second is reporting.

The specifications outlined in this appendix represent an optimal software package that would allow the care coordinator to perform their job functions in the the most effective manner. However, due to the pilot nature of the occupational health services project, the cost associated with establishing the ideal software environment may not be practical. Because of this, some effort is made to differentiate between the optimal software specification and the minimum specifications. Those items that are marked with a (*) are considered to be critical to the Care Coordinator's job functions and, therefore, should be considered to be a minimum standard for any software package. All other items represent features that would improve the effectiveness of the Care Coordinator but would not necessarily hamper their ability to provide basic care coordination functions.

Data Management Features
For ease of presentation the individual components of the software will be discussed. This is for presentation purposes only, and in no way reflects how the software should actually be laid out. However in order to simplify use of the software and reduce data entry, the software should be organized in some relational manner so that provider demographics, employer information, work site information, and patient information is only entered a single time and then referenced in other sections of the software.

***Basic Injury Information*:**
This component is where the basic information about each individual injury is recorded and maintained. Ideally, the majority of information in this section of the software would closely parallel the information found on the Report of Accident (ROA) form. When the ROA is entered either electronically or manually within LINIIS, the interface with the COHE software should result in the opening of a new injury record and automatic population of the data fields in this section. This would include <u>all</u> of the basic information from the worker section of the ROA as well as pieces of core medical information, including:
- *All diagnosis information associated with the claim using ICD9 format
- *Current work status
- *Care coordinator assigned to the claim
- *Primary attending physician

- *Patient's subjective description of the injury
- Physician statement of causal relationship
- *Prior related history
- *Initial date of treatment
- Assignment of applicable treatment guideline
- *Final case disposition and closure date
- *Lost time days and cost to date (imported from LINIIS)
- Medical costs to date (imported from LINIIS)

Specific details regarding treatments would not be included within this segment of the software.

Medical Treatment Detail:*
In a relational format, every record within the basic injury information component would likely have multiple records in the treatment detail section. This is where the summary of the medical encounter is entered. Key data elements would include:
- *Date of treatment or appointment
- *Brief description of the treatment or purpose for the appointment
- *Attending provider or practitioner name or code
- *Code for classification of type of treatment
- Codes for tests ordered or conducted
- Link to work restrictions form
- Prescriptions ordered
- *Prognosis dates for recovery and return to work
- *Current claim status with Labor and Industries

As a patient tracking tool, this segment would be used to enter all activity associated with the case including physician visits, appointments for testing, therapy visits, and telephonic encounters. When completed it creates a full chronological history of the medical and tracking activity for the case.

To be fully effective as a tracking tool, the system should have safety mechanisms built in to prevent any case from being lost or forgotten due to operator error or oversight.

Treatment Quality Indicators
A component should be available for the detailed entry of each step of any available diagnosis-specific treatment guidelines. In the case of the pilot study, the treatment guides for low back injury, carpal tunnel syndrome, and fractures of the upper and lower extremities would be used. Each treatment guide should be assigned a code that can then be used in the injury component of the software so that the applicable guide can be assigned to each injury.

The guideline itself should be entered in detail, with each step containing the associated length of time, post-injury, when that the step should occur. Each of these steps should be assigned a standard code that is then used for data entry into the treatment detail section of the software. This will make it possible to use the software to run an automated analysis of when specific activities are taking place throughout the treatment process, compared to the timelines of the assigned guideline. This analysis serves to monitor quality and identify cases where intervention is warranted.

Employer Background Data*

This component will include basic background information about the employer, including:

- *Basic demographic information for all locations of business
- *Primary contact(s) and phone number(s) for injury coordination activity
- *Availability of transitional duty
- *Any known functional job descriptions, particularly for standard transitional duty positions

Provider Profiles*

Each provider who is participating in the workers' compensation system should have a profile that includes:

- *Provider number
- *Basic demographic and licensing information
- *Specialty
- *Business hours and policies for accepting referrals
- *Any Labor and Industries or COHE preferred provider designation or status
- Any fields necessary to track any provider credentialing requirements that are put into effect by Labor and Industries or the COHE
- Educational or CME activity that is specific to workers' compensation

Reporting Capabilities*

Any information management system is only as good as its associated reporting capabilities. In the absence of the ability to provide useful information in the form of reports, the data that are entered are of no real value. Reporting may come in either a query format or printed format.

- **Query Reporting***
  This refers to information that is pulled on demand and viewed on screen. It is useful for quickly finding isolated pieces of information. Query reporting is of value to the care coordinator, and as such the

system should have the capacity to query against useful fields located within any of the sections of the software.

Query reporting should also be made available to employers and providers who elect to directly access information for their own incidental purposes.

- **Printed Reporting***
  There is no way to anticipate every report or report format that may be needed to support the care coordination process. However, based upon the conclusions of the white papers as well as some of the known basic functions of care coordination, there are some reporting capabilities that can be identified as being the basic minimum of any system.

  - *Tracking reports should be available for the care coordinator. These reports identify which patients have appointments on any given day or which cases have some outstanding activity that has not been updated by the attending provider. Following the tracking reports insures that no case is "lost" and that the goal of 24-48 hour updates is met. Tracking reports would monitor physician visits, outstanding test results, care coordination activity, and outstanding requests for authorization for treatment.

  - Quality assurance reports to monitor compliance with all desired quality indicators including reporting, educational activity, and adherence to treatment guidelines.

  - *Outcomes reports to monitor any claim activity against any desired benchmark such as:
    o Duration of medical care
    o Cost of care
    o Lost and light duty days
    o Occurrence of re-injury
    o Compliance with guidelines

  - *Provider summary reports including notification of referrals and medical treatment history to date.

  - *Employer summary reports that provide a written summary, on a regular basis, of the current status of all active claims. Because employer surveys indicate that not all employers necessarily want to be bothered with too much additional information,[13] the software system would ideally include the ability to indicate which reports

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[13] Washington Labor and Industries survey of employers conducted by Gilmore Research Group in September 2000, indicating that nearly three quarters of employers do not routinely receive the information needed to manage their own workers' compensation issues.

are to be generated on a routine basis. This information could be included as part of the company profile section of the software.

- *Injury trending reports that monitor trends of injuries for patients, jobs, and employers, and serve as triggers for injury prevention and ergonomic intervention activities.

- *Treatment summaries that can provide an easy-to-follow, chronological summary of all medical and case management activity to date.

Security Issues

Any time information is exchanged between parties — especially in an electronic format — there will be concerns regarding security. Those concerns are increased to some degree anytime a centralized database is used that can be electronically accessed by many different people. To insure that access will be available to the people who need information without compromising patient confidentiality, the system will need to have some basic security features.

- *Each record must be tagged with a location identification code that is specific to the COHE responsible for the care coordination. Individual user logon profiles for each care coordinator must also be attached to their COHE identification code. By doing this, the care coordinators can be limited to viewing only those cases for which their COHE is responsible.

- *Each record must be tagged with a specific employer identification code. Like the care coordinators, each employer will be assigned a secured access that is linked directly to a unique identification code so that authorized individuals can only view records associated with the injuries that occurred within their workplace.

- *Providers should only be able to access records in which they are listed as the primary provider or treating specialist for the case.

- *If access will be via the Internet, care must be taken to insure authentication and encryption of data.

- *System must be Health Insurance Portability and Accountability Act (HIPAA) compliant.

APPENDIX B

Application Server Architecture Comparison[14]

Application server computing has been widely adopted by the corporate mainstream as the most efficient, flexible, and cost-effective system for application delivery and administration. It addresses the enterprise challenges of optimizing application reach, speed, and security, and reducing computing costs. Where alternatives require an additional server as a middle tier between the application server and the client, Citrix Systems, Inc. installs software directly on top of the application server. Following is a comparison of these approaches.

The "additional server" architecture uses a dedicated server and accompanying technology as an intermediary, or middle tier, between Microsoft Windows 2000 Terminal Services/NT 40 TSE or UNIX® servers and a Windows or Java client device. This dedicated server translates the respective Windows or UNIX protocol (RDP or X.11) into a proprietary protocol that can deliver application access to the client.

The architecture provided by Citrix uses proprietary software that is installed on top of Microsoft Windows 2000 Terminal Services/NT 40 TSE or a Sun Solaris, IBM AIX® or HP-UX® server. The Citrix ICA protocol delivers low-bandwidth connectivity to virtually any client, without translation.

The Citrix architecture offers a number of advantages, which stem primarily from its greater simplicity and direct connection between application server and client:

- *Less complexity/lower cost:* adding another server to the architecture adds a layer of complexity, cost, and a single point of failure to the system. Citrix's model simplifies the delivery of applications by eliminating the need for a middle tier.

- *Improved performance:* the need to translate protocols can degrade application performance. Using a single protocol to connect the application server and client, as Citrix does, enhances performance.

- *Centralized management:* with Citrix, application management and support remain on the application server; all users, applications, and even Web deployment are administered from the same server or server farm. The "additional server" option divides administration between the application server and the middle tier, thus diluting the benefits of centralized management.

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[14] Information abstracted from White Papers found at www.citrix.com

In summary, the best way to realize maximum business benefits from an application server computing system is to keep it simple. Citrix not only provides streamlined server architecture, but also increases user productivity and reduces complexity on the client side by supporting virtually every type of device natively.

How does it Work?

The core technology for Citrix application server computing is Independent Computing Architecture (ICA), a remote presentation services protocol that provides the foundation for turning any client device into the ultimate thin client. ICA technology includes a server software component, a network protocol component, and a client software component.

Server: ICA has the unique ability to separate an application's logic from its user interface. The application executes 100 percent on the server, and only the user interface is actually transmitted to users. For this reason, application serving is able to centralize all system, application, and user management on the server for greater efficiency and lower cost of ownership.

Network: ICA enables an application's user interface, as well as keystrokes and mouse movements, to be transported to and from the client over standard network protocols — TCP/IP, PPP, IPX, SPX, and NetBEUI — and over popular network connections, including asynchronous, dial-up, ISDN, Frame Relay and ATM. With a server-based architecture, applications require only a fraction of the network bandwidth of a client/server model. Therefore, ICA allows the latest, most powerful applications to be transmitted rapidly over standard networks or the Internet.

Client: By centralizing application processing on the server, ICA turns any PC into a thin client that only needs to be able to display and manipulate the user interface. The specific memory, features, and brand of the device are irrelevant. Traditional PCs and workstations can be used without any problems.

Security: Citrix Metaframe incorporates 128-bit encryption, creating a formidable barrier against unauthorized users attempting to interpret ICA transmissions. SecureICA works with existing networks, including the Internet. Further, it is transparent to users, with no measurable change in response time.

APPENDIX C

Occupational Health Software Resources

The Stolas Group, Inc.
6061 N. Fresno Street, Suite 104Fresno, CA.   93710
Phone: (559) 431-9450
Fax: (559) 431-4322
Web Site: www.stolas.com

Unique Software Solutions, Inc.
Occupational Health Manager software
1261 Lake Plaza Drive
Colorado Springs, CO 80906
719-457-8100
Web Site: www.usscolorado.com

THE SSI GROUP, INC.
HEALTH MANAGEMENT TECHNOLOGIES DIVISION
2151 Salvio St., Suite 333
Concord, CA 94520
Sales Information: Phone: 800-647-7007
Fax: 925-969-8305
Tech Support: 800-766-1736 Ext. 241
Email: hmtsales@ssigroup.com, hmtsupport@ssigroup.com
Web Site: www.thessigroup.com

Integritas, Inc.
STIX software
Suite 112
2600 Garden Road
Monterey, CA 94930
Sales: 800-458-2486
Phone: 831-657-2000
Fax: 831-657-2001
Technical Support: 814-941-7006
Web Site: www.integritas.com

Occupational Health Research
SYSTOC software
P.O. Box 900
Skowhegan, ME 04976
Sales: 800-444-8432
Fax: 207-474-6398
Technical Support: 800-779-3887
Email: sales@systoc.com
Web Site: www.systoc.com

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